



The
**National Energy Solutions
Institute**
at Oklahoma State University
and the
NESI-SES Association





: Energy solutions

- The **National Energy Solutions Institute** fuses the needs of private industry in energy production, distribution and conservation with practical and impactful academic research.
- The goal is to provide **energy solutions** for the current and future needs of the nation as our scientists work in collaboration with private, state and federal sectors to enable the nation's transition to a sustainable energy future.



:Energy solutions

- NESI also emphasizes education and training in order to supply the state and nation with the educated workforce needed to advance energy technology, policy and economics.
- NESI acts as a focus for outreach activities to provide topical and relevant information to policy makers and technologists to enable the growth of sustainable energy enterprises in the modern world.

Some Research Focus Areas



- ▶ **Unconventional Hydrocarbon Fuel:** Oil & Gas recovery & production. Geology, geophysics and petroleum engineering



- ▶ **Clean Fuel Production:** Reduced carbon emissions, carbon sequestration



- ▶ **BioEnergy:** Holistic approach including alcohol production, land use, distribution, transportation.



- ▶ **Power:** Generation, transmission and distribution. Efficiency, smart grids, microgrids.

Some Research Focus Areas



- ▶ **Wind Power:** Oklahoma Wind Power Initiative (OWPI). Concepts, subsystems, components, software



- ▶ **Conservation:** Energy conservation, sustainability and management. Energy efficiency



- ▶ **Policy:** Recommendations and advice to policy makers. Economics and Finance. Future trends. Local and state government.



- ▶ **Education and Training:** Classroom, fieldwork, continuing education, internships, workforce development.

Some Research Focus Areas



- ▶ Efficient provision of electric power to oil and gas producers

DER/Microgrid



- ▶ Growth of Distributed Energy Resources (DER) and Microgrids to the utility system.

Sensors - Collective Intelligence

- ▶ Optimization of sensors for the energy industry. Increased efficiencies on the grid. Deployment and implementation. Risks mitigation



- ▶ Database and Command Center for CIM model development, information sharing, and business analytics

Alignment with State Energy Plan



Oklahoma First Energy Plan, 2011

Governor Mary Fallin
Secretary of Energy Michael Ming

▶ ABOUT



"The Oklahoma First Energy Plan looks to optimize our energy system by efficiently leveraging our natural resources with an 'all of the above' approach to energy. The NESI research at OSU and partnership with SES compliment the state's vision for the future of energy in the United States."

-Governor Mary Fallin, State of Oklahoma



Partnerships



CREC, OSU, Guernsey, City of Stillwater



Engineers and Consultants



Utility Provider; Electric Cooperative



Utility Provider; Electric Cooperative



OK Association of Electric Cooperatives



Farm Credit System for Coops; Ag and Energy sectors

NESI-SES Association



A Membership-driven organization, the purpose of which is to provide:

- (1) Funding for NESI
- (2) Industry information to align NESI research activities
- (3) Feedback and advice

Established on the principles of:

- (1) Collaboration
- (2) Collective Intelligence
- (3) Business Analytics

Web Site: nesi-ses.org